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Foreward

Moisture: The problem that any conservator faced in his professional life



Human beings owe life on planet Earth to the presence of water, its diffusion at every latitude, and to its special nature. Generally speaking we look at water as a friend; but when professionals working in historic building start a new project, for sure they will be concerned about the presence of water. Hence in the field of conservation the point of view dramatically changes and water is considered as an enemy. Most of decay mechanisms involve the role of water: biological growth, salt crystallization, freeze-thaw cycles, expanding clays presence, just to name a few. Unfortunately the complete removal of water is not possible (it should be not beneficial anyway...), especially as regards that part of heritage, which is conserved in outdoor or in semi-confined environment. A big part of building conservators tasks require efforts in locating, measuring and then removing, moisture from masonry surfaces and structures. As a scientific community working on built heritage, we share these efforts with all those professionals in charge of building maintenance, even if not belonging to heritage. Hence moisture in masonry represents a big issue, which could be summarized as follows:

- monitor its presence during seasonal cycles;
- measure its amount and individuate possible damage thresholds depending on the specific sensitivity of the building and of special decorative elements such as mural paintings and stuccoworks;
- remove the excess of moisture choosing the removal techniques taking into account the best balance in between effectiveness and invasiveness.

Scientific literature in the field is very rich and several research programs were devoted to the topics above summarized.

This special issue of the *Journal of Cultural Heritage* focuses on innovative techniques used to measure and reduce water content in masonry. The papers present and compare data collected from experimental study cases in Europe.

The results of these studies are part of the Moisture Detection in Historical Masonry (MODihMA) research project that involves experts from many European research laboratories. The first conference of the project (2011) aimed to compare data provided by different techniques to understand how the quantitative data obtained are directly related to water content on a macro- and micro-scale; moreover those different techniques were compared by the point of view of sensitivity and accuracy. The second issue of the MODihMA conference (June 2018) aims to compare also the methods for reducing rising damp available at present. In fact, in the

last twenty years, new companies have been entering the market of devices to prevent/reduce rising damp in buildings.

The working principles is not always clearly explained and displayed, both in the advertisements and on the websites of the companies producing and selling the devices. Some new application is presented as non destructive, and less expensive if compared to the traditional method to contrast rising damp, as insert waterproof barriers in the masonry, excavation of tunnels around the building and crawling spaces beneath the ground level floor, removal of damaged plaster and plastering with macro-porous mortars. Therefore, the application of the new devices is very attractive and their use conquered the market competing with more traditional methods.

The present issue of the Journal begins with a feature paper that presents the role of monitoring in the decision process that supports the intervention: “When and how to reduce moisture content for the conservation of historic building. A problem solving view or monitoring approach?” shows also the ongoing development of monitoring for facing the threats due to climatic changes.

The paper by Elisa Franzoni (Bologna University) “State of the art on methods for reducing rising damp in masonry” summarizes the more recent scientific literature providing a complete framework of reference, useful for anyone who desires to approach the topic.

Dario Camuffo (CNR ISAC) with “Standardization activity in the evaluation of moisture content” faces the crucial topic of sharing measures methods and to build up the needed standards.

Barbara Lubelli (Delft University of Technology, faculty of architecture) in “Effectiveness of methods against rising damp in buildings: the EMERISDA project” summarizes the main results of an important project, witnessing the special attention given by European funding programs to problems given by moisture in masonries and its possible solutions.

The works by Yves Vanhellemont “Are electrokinetic methods suitable for the treatment of rising damp?”, Alessandra Bonazza (CNR-ISAC) “Efficiency evaluation of treatments against rising damp by scale models and test in situ”, Nicola Ludwig (UNIMI Dep. Physics) “Does electro osmosis work in moisture damage prevent? Applicability of infrared-based methods to verify water distribution under electric fields”, and Riminesi (CNR ICVBC) “Assessment of the effectiveness of a dehumidification system operating by emission of electromagnetic fields” constitutes the “core” of this special issues, presenting to the reader the effects of electric fields applied to damp masonry materials in lab and results obtained in removing excess of moisture and/or preventing its new formation in several study

cases or lab model samples. These results have been obtained with different techniques based on “electric” working principles, so that their discussion could provide a good tool in comparing the effectiveness of new methods when compared with more traditional ones.

The wall base ventilation method is presented by Isabel Torres, (University of Coimbra, Civil Engineering Dept) in “New technique for treating rising damp in historical buildings: wall base ventilation” who worked on lab models also.

Rob van Hees “Delft University of Technology, faculty of architecture: New test methods to assess potential of chemical injections in case of rising dam” focuses his attention on chemical methods and finally; Rita Vecchiattini (State University Genova) “Moisture monitoring experiences in the old town of Genoa” reports on interesting case studies monitored for a prolonged time”.

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